DOCUMENT RESUME

ED 359 725 EC 302 290

AUTHOR	Johnson, David R.; And Others
TITLE	Evaluating the Effectiveness and Efficiency of Supported Employment Programs. Policy Research Brief.
INSTITUTION	Minnesota Univ., Minneapolis. Research and Training Center on Residential Services and Community Living.
SPONS AGENCY	National Inst. on Disability and Rehabilitation Research (ED/OSERS), Washington, DC.
PUB DATE	May 93
CONTRACT	07DD0282101; H133B80048
NOTE	14p.
AVAILABLE FROM	Institute on Community Integration, University of Minnesota 109, Pattee Hall, 150 Pillsbury Dr., S.E., Minneapolis, MN 55455 ($1).
PUB TYPE	Information Analyses (070) -- Reports - Evaluative/Feasibility (142)
JOURNAL CIT	Policy Research Brief; v5 n2 May 93
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Adults; Agencies; Case Studies; *Cost Effectiveness; *Disabilities; Efficiency; *Evaluation Methods; Models; Policy Formation; Program Costs; Program Effectiveness; *Program Evaluation; Public Policy; *Supported Employment; Vocational Rehabilitation
IDENTIFIERS	*Minnesota

ABSTRACT

This policy research summary outlines the paradigms and processes used in recent research and evaluation studies conducted on supported employment and rehabilitation programs in Minnesota. First, the paper reviews evaluation strategies and models for assessing the individual and societal efficacy of supported employment. It identifies key effectiveness evaluation activities such as identifying outcomes, developing a conceptual framework, specifying comparisons, and specifying outcomes and indicators. Principles of efficiency evaluation are also addressed. Second, the paper presents a case study and methodology for evaluating supported employment costs and benefits. The case study sample included 11 agencies at 13 sites in Minnesota, with 41 program options. Results are reported in terms of: consumer demographic characteristics and work activity, agency and program costs, and benefit-cost estimates. Third, the paper offers recommendations for strengthening current evaluation methods and practices as a means of improving the quality, effectiveness, and efficiency of supported employment programs. Recommendations focus on: the importance of reaching professional consensus on desired goals and outcomes; the need for improved conceptual frameworks; and the importance of controlling for individual characteristics. (Contains 44 references.) (DB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED359725

Policy Research Brief

CENTER ON RESIDENTIAL SERVICES AND COMMUNITY LIVING
COLLEGE OF EDUCATION
UNIVERSITY OF MINNESOTA

Evaluating the Effectiveness and Efficiency of Supported Employment Programs

This issue of Policy Research Brief summarizes the paradigms and processes used in several recent research and evaluation studies conducted on supported employment and rehabilitation programs in Minnesota. The purpose of this brief is threefold. First, to provide an overview of evaluation strategies and models for assessing the individual and societal efficacy of supported employment. Second, to present a case study and methodology for evaluating supported employment costs and benefits. And, finally, to offer recommendations for strengthening current evaluation methods and practices as a means of improving the quality, effectiveness, and efficiency of supported employment programs. This policy brief was prepared by David R. Johnson, Darrell R. Lewis, and Robert H. Bruininks of the Center on Residential Services and Community Living, University of Minnesota.

■ Introduction

The recent emergence of supported employment (SE) programs in the United States has substantially raised expectations concerning the viability of employment in promoting the integration, productivity, and independence of persons with severe disabilities. SE is designed to serve persons who typically do not benefit from traditional time-limited vocational rehabilitation services. Unlike other vocational rehabilitation programs, such as transitional employment, SE is intended for persons with more severe disabilities. Major components stressed in SE services have been (a) pay for real work, (b) integration in the workplace with non-disabled co-workers, (c) long-term ongoing supportive services to facilitate job retention, (d) placement of individuals with severe handicapping conditions, and (e) interagency cooperation and funding of these services (Shafer, Wehman, Kregel, & West, 1990).

EC 302490

Today, SE is being advocated on the basis of its positive social and economic impact on individuals and its economic benefits to society. The extent to which SE programs are fulfilling these individual and societal goals and outcomes remains center-stage in deliberations regarding the expansion of such services nationally. Questions concerning SE costs, accountability, and effectiveness are increasingly being asked by policymakers and professionals at the federal, state, and county levels. In addition to earnings and other related economic outcomes and benefits, the efficacy of SE is being judged on its capacity to achieve employment integration for individuals served. It may be argued that without a better understanding of the multi-dimensional nature of employment integration and its inter-relatedness to other SE outcomes (e.g., increased earnings and placement rates) and costs, the current high levels of public and professional support for this program alternative may diminish (Johnson & Lewis, in press). This will require that present methods for evaluating SE's efficiency and effectiveness (i.e, its net individual and societal worth) be substantially improved.

■ Evaluation Strategies and Methods

Evaluation methods and strategies vary extensively, depending upon the focus of evaluation (e.g., outcome assessments, program accountability, cost-benefits), and the key evaluation questions to be addressed through the analysis (e.g., Is SE effective in assisting persons with

A summary of research on policy issues affecting persons with developmental disabilities. Published by the Research and Training Center on Residential Services and Community Living, Institute on Community Integration (UAP), College of Education, University of Minnesota.

BEST COPY AVAILABLE

disabilities to achieve higher levels of earnings? Overall, are these services cost-effective and cost-beneficial to society?). Evaluation schemes also vary based on the intended use of information and data obtained to facilitate policy development, program planning and development, improvements, cost containment, and other elements of program design and operations. Examining social programs from the perspective of their effectiveness and efficiency remains the most central purpose of program evaluation.

Effectiveness Evaluation

The notion of what constitutes an "effective" SE program means different things to different people. Individuals with disabilities and family members are inherently concerned with SE's capacity to improve individual levels of economic self-sufficiency and quality of life. Professionals and policymakers certainly hold similar interests, but their attention is also directed to the broader aspects of program operation and management (i.e., achievement of agency mission, staff productivity, agency accountability, capacity to address differing characteristics and needs of individuals served, and other aspects of program delivery). In broadest terms, effectiveness evaluation involves identifying (from differing perspectives) and measuring the multiple goals and outcomes of a social program.

Research and evaluation methods focusing on SE programs are still in their early stages of development. To date, evaluation studies in SE have investigated outcomes from a narrow and often, singular perspective, such as earnings and related economic outcomes, attained levels of physical and social integration, or improvements in quality of life among program participants. From a program effectiveness standpoint, the tendency has been to identify and attempt to measure an array of intangible social benefits, largely included within conceptual paradigms of integration and quality of life, to express the socially desirable benefits and outcomes (effects) of SE. While studies of this nature have contributed a substantial base of important and timely information that has aided professionals and policymakers in understanding the relative merits of SE, rarely are these multiple economic and social outcomes linked into an integrated or multi-dimensional perspective. This has not only limited our understanding of supported employment's effectiveness in achieving its goals, but has prevented efforts to link multiple program outcomes to costs. Linkage is essential when attempting to derive meaningful cost-effectiveness measures. Such measures are also of critical importance in comparing alternative SE models and current service delivery options.

Effectiveness evaluation commonly entails the following activities: (1) identifying key outcomes, goals, and information needs; (2) developing a conceptual framework to guide the evaluation process and subsequent analyses; (3) specifying the nature of comparisons to be made; (4) specifying and operationalizing multiple outcome measures and indicators; and (5) collecting and analyzing outcome and other data appropriate to addressing earlier information needs and questions (DeStefano, 1990; DeStefano & Wagner, 1990; Lewis, Johnson, Bruininks, Kallsen, & Guillery, 1991; Schalock, 1988; and Schalock & Hill, 1986). A brief explanation of these key activities follows:

- **Identifying Outcomes, Goals and Information Needs.** This initial step in effective evaluation involves stakeholders (i.e., individuals with disabilities, family members, professional staff, advisory board members) and others in a collaborative planning process to identify key evaluation questions and related outcome measures for study and analysis. Such participation is not only important, but also improves the quality of the evaluation design and support for results obtained later.

- **Developing a Conceptual Framework.** Conceptual frameworks and models are often used to depict critical dependent and independent variables expected to influence outcomes in employment programs. Most models attempt to illustrate the interactive nature of individual and program variables related to SE outcomes. In simplest terms, a typical conceptual framework or model used in evaluating rehabilitation programs would examine the inter-relationships between system inputs (the client), intervention (rehabilitation services the client receives), and output/outcomes (the extent to which the client achieves intended employment goals). Frameworks also set the context for examining inter-relationships among key variables (or variable clusters), along with the hypothesized path of influence. Such conceptualizations are important in determining later methods of analysis (i.e., univariate or multivariate procedures).

- **Specifying Comparisons.** In order to conduct program effectiveness evaluations, comparisons must be specified and available to the evaluator. Several comparisons can be employed in evaluating the effectiveness of SE programs: (a) intra-program comparisons of differing SE models (i.e., individual placement, enclave, mobile work crew, and entrepreneurial models; sheltered work vs. supported employment); (b) comparisons by consumer characteristics (i.e., disability type and level, gender); (c) cross-program/agency comparisons; and (d) longitudinally based comparisons of the same individuals or programs over time. The reader should consult other reviews describing detailed procedures and techniques for establishing comparison groups for analyses (Attkisson, Hargreaves, Horowitz, & Sorenson, 1978; DeStefano & Wagner, 1990; Madaus, Scriven, & Stufflebeam, 1985; Posavac & Carey, 1980; and Rossi, Freeman, & Wright, 1975).

- **Specifying Outcomes and Indicators.** Identifying, selecting, and operationalizing relevant and measurable outcomes is one of the most pressing issues in conducting

meaningful outcome or effectiveness evaluations of SE. Individual outcomes are most often categorized in monetary and nonmonetary terms. Monetary outcomes include wages received per hour or week, net annual earnings (less taxes paid), hours worked per week, and job tenure. Nonmonetary outcomes include employment integration, quality of life, and skill acquisition and maintenance.

Effectiveness evaluation also assesses a program's accomplishments in achieving its mission and goals. Here, too, monetary and nonmonetary criteria and outcomes can be measured. Summative information can be developed to measure program effectiveness (e.g., program placement rates in community employment, average earnings and related work benefits attained by program participants, degree or level of agency change-over from segregated to integrated employment). Nonmonetary outcomes may include levels of satisfaction expressed by consumers, family members, and employers with the quality and effectiveness of employment services provided by the program or agency.

Evaluations of SE programs from the broader context of the service delivery system and society as a whole have also recently been advocated (Schalock & Hill, 1986; Schalock, 1988; Schalock & Thornton, 1988; Wehman Kregel, & Shafer, 1989). Based on this view, networks of organizations dispensing a variety of social programs for individuals with disabilities also need clearly articulated goals and outcomes by which to judge the quality and effectiveness of their performance.

- **Analyzing Outcome Data.** An extensive review of various approaches used in analyzing outcome data and information goes beyond the scope of this publication. Decisions about how data are to be analyzed should be made early in the planning stages of an outcome assessment, in conjunction with decisions about information needs, variables and their measurement, data sources, and audiences (DeStefano & Wagner, 1990). Detailed discussions of appropriate data analysis strategies and techniques can be found in Bolton (1987); Borg & Gall (1983); Kleinbaum, Kupper, & Miller (1988); Rossi et al. (1975) and Walls & Tseng (1987).

Efficiency Evaluation

In the evaluation of programs serving persons with disabilities, benefit-cost analysis increasingly is being used to determine whether or not a particular program is "worth its cost" (i.e., whether the program generates outcomes for individuals with disabilities that justify the costs of producing them). The federal-state vocational rehabilitation (VR) program was one of the first to extensively use benefit-methodologies in evaluating service costs and benefits (Berkowitz, 1980). Since the mid 60s, benefit-cost analysis also has been used in large-scale evaluations of federal transitional training programs for persons with disabilities (e.g., Kerachsky & Thornton, 1987), and in assessing other demonstration projects that have focused on the training and employment of individuals with disabilities (Hill & Wehman, 1983; Schneider, Martin, & Rusch, 1981). More recently, benefit-cost analysis also has been used in the evaluation of SE services for individuals with severe disabilities in comparisons with other employment and rehabilitative activities (e.g., Hill, Wehman, Kregel, Banks, & Metzler, 1987; Lam, 1986; Lewis, Johnson, Bruininks, Kallsen, & Guillery, 1992; Noble, Conley, Banerjee, & Goodman 1991). Today, almost all state vocational rehabilitation agencies employ some form of benefit-cost analysis for reporting to legislatures and policymakers on the likely efficiency results from traditional vocational rehabilitation activities. Unfortunately, most state vocational rehabilitation agencies do not systematically collect and report information on the costs and benefits of SE programs (Lewis, Johnson, Chen, & Erickson, 1992).

The application of benefit-cost analysis as a strategy for evaluating employment and training programs has continued to be a subject of substantial controversy. This has been due, in large part, to insufficiencies of data concerning the benefits and costs of programs and to the extreme sensitivity of the results of benefit-cost models to their underlying assumptions relating to discount rates, earning streams, comparison groups, and the like. Several excellent critiques of the conceptual and methodological limitations of using benefit-cost analysis to evaluate employment and training programs for individuals with disabilities can be found in Conley & Noble (1990), Johnston (1987), Noble & Conley (1987), Rhodes, Ramsing,& Hill (1987), and Thornton & Maynard (1989).

Benefit-cost analysis is essentially a comparison that involves several logical steps and procedures for estimating and valuing the full range of economic and social outcomes of programs. These steps include: (1) defining the program and its alternatives, (2) determining the analytical perspective, (3) listing the benefits and costs, and (4) valuing program effects and costs. In lieu of detailing these procedures in this publication, a case-study addressing the application of a benefit-cost methodology in evaluating SE programs in Minnesota is offered.

■ Case Study: A Benefit-Cost Analysis*

In 1990, the state of Minnesota was concerned with its lack of knowledge about the economic outcomes of supported employment. Accordingly, a benefit-cost study was commissioned to examine this question. The study, initiated in 1990, focused on the development and use of a resource components cost model to establish benchmark

cost and resource use estimates for 11 SE service agencies at 13 program sites in Minnesota (Lewis, Johnson, Bruininks, Guillery, & Kallsen, 1991). The sample of agencies was drawn from five Minnesota counties and included five day activity centers (DACs), four vocational rehabilitation facilities, one mental health program, and one Regional Treatment Center. Data were also collected on the demographic characteristics and programs outcomes of persons with disabilities served in these agencies through four alternative program models: (a) habilitation training, (b) on-site sheltered employment, (c) community group supported employment, and (d) community individual supported employment. Thus, the study sample included 11 agencies at 13 sites, with 41 program options. From these data, several benefit-cost ratios were estimated to explain possible efficiency effects resulting from these programs.

Data Sources

The information and data on the agency resources employed and their respective costs were collected through examination of program reports, budget and audited expenditure records, and discussions with key service agency program personnel. Similarly, information and data on consumers and services at each of the 13 program sites were collected through examination of service agency and program records, and discussions with key service agency program personnel. All data on individuals with disabilities served through these programs were collected from agency files and records by agency personnel and reported in a manner so as to protect the confidentiality of clients. All resource and cost data were collected for the January 1, 1989, to December 31, 1989, fiscal period for six of the agencies, and for the July 1, 1989, to June 30, 1990, for the other five agencies. All consumer and program information and data were collected for the same respective periods.

Questions Posed by the Study

The study attempted to assess four sets of questions. The first dealt with estimating costs associated with the delivery of the four types of training and employment services identified earlier. For each of the four sub-program areas, average costs were estimated per year, per day, and per hour on an individual client basis. A second set of questions dealt with estimating the benefits associated with the delivery of the four types of sub-programs. The benefits similarly were estimated in annual, daily, and hourly terms. A third set of questions attempted to assess the likely efficiency effects of the alternative service programs, and the results were estimated and examined in benefit-cost terms. Finally, a fourth set of questions dealt with how the different program costs related to differing program, client, and agency characteristics. Specifically, the costs of program operations were related to: (1) the type of training and employment program, (2) client characteristics, (3) the number of participants, (4) job placement and hours of work, (5) staffing ratios, and (6) geographic location of program, (i.e., urban vs. rural.)

Information on individual consumers' work activities was collected relating to type and level of program participation (e.g., number of daily hours and days per year within each sub-program area) and earnings (e.g., hourly wage rates and annual earnings within each sub-program area). Data was collected to illustrate variable rates of consumer participation across agencies and programs. Random sampling procedures were used to identify representative samples from the populations served by these agencies.

Methodology

- **Cost-Accounting Framework.** The cost-analysis technique employed in this study was a resource component approach to costing out training and human service programs, similar in method to several other cost studies undertaken by the authors (Lewis, Bruininks, & Thurlow, 1989, 1990), and by others evaluating transitional employment programs (Kerachsky et al, 1985). This approach requires: (1) a comprehensive listing of all the direct program and supplemental services within an agency or delivery system; (2) the identification, measurement, and valuing of the specific resources employed within each direct program and supplemental service area; and (3) the allocation of resource costs associated with all supplemental service areas to each of the direct program areas. On the basis of these allocated cost data and the number of clients, or client-days and hours of service provided by each program area, overall program costs were determined, along with various client-unit costs (e.g., per year, per day, or per hour). The cost analyses and methodology of this study focus on actual client uses of service (e.g., hours or days of service), not on categories of budget or reimbursement or administrative classifications of clients.
- **Client Demographic Characteristics and Work Activities.** An important aspect of the study was to provide a comparison of program and sub-program costs with descriptive information on the clients served by each agency within their respective programs. Although total costs for selected program and sub-program areas may be similar between agencies, when costs are adjusted for numbers of clients (along with variable days and hours of training) and differences in client demographic characteristics, diagnostic, and skills information, important differences in average unit costs can and often do occur. Even though analysis of agency program and sub-

* The design and results reported for this case study are taken from a larger benefit-cost study of SE programs in Minnesota funded by the Minnesota Division of Rehabilitation Services (Lewis, Johnson, Bruininks, Kallsen, & Guillery, 1991). See reference, p 11.

program costs was viewed as one of the primary foci for the study, comparing such costs to the differing characteristics of clients served provided important information for interpreting differing patterns of resource use.

Two procedures were used to collect descriptive information on persons served by each agency across the distribution of sub-program areas (e.g., habilitation training, on-site sheltered employment, group and individual SE, as well as competitive employment). The Inventory for Client and Agency Planning [ICAP] (Bruininks, Hill, Weatherman, & Woodcock, 1986), was used as the primary instrument for collecting demographic, diagnostic, and other descriptive information on persons with disabilities included in the study. A second instrument was used to collect information on individual levels of work activity relating to type and level of program participation (e.g., number of daily hours and days per year by program area) and earnings (e.g., hourly wage rates and annual earnings by program area). These data were collected to illustrate the variable rates of client participation across agency programs.

- **Benefit Cost-Accounting Framework.** An illustrative accounting framework employed in the study for analyzing the benefits and costs of SE appears in Table 1. The perspective and taxonomy presented is based, in part, on previous recommendations by Thornton and Maynard (1989) and Noble (1977) from their earlier work in benefit-cost analysis of vocational rehabilitation programs. Table 1 summarizes, as an illustration of the framework, the benefits and costs of SE services for persons with disabilities in a community program as compared to an on-site work setting in a day activity center at Agency A. All data presented in Table 1 have been adapted from the actual results reported in one of the cases (i.e., Agency A) in the study and are detailed and available in the *Cost Benefits of SE: Technical Appendix* (Lewis, Johnson, Bruininks, Kallsen, & Guillery, 1991).

The accounting framework depicts SE benefits and costs from the three stakeholder perspectives of consumers/families, other taxpayers, and society as a whole. The primary purpose of this format is to organize and conduct analyses so as to ensure that all major impacts of the

■ Table 1: Benefits and Costs of SE per Year

Community Individual SE Versus On-Site Employment

	ANALYTICAL PERSPECTIVES		
Impacts	Social	= Consumer	+ Other Taxpayers
Benefits:			
1) INCREASED PRODUCTIVITY			
Additional Earned Income	$2,518	$2,518	$0
Additional Fringe Benefits	$277	$277	$0
2) REDUCED USE OF ALTERNATIVE PROGRAMS			
Costs of On-Site Employment	$6,345	$0	$6,345
3) DECREASED GOVERNMENT SUBSIDIES			
Reductions of SSI/MA Payments	$0	($810)	$810
4) OTHER BENEFITS			
Increased Community Integration	+	+	+
Increased Quality of Life	+	+	+
Increased Self-Esteem	+	+	+
Total Benefits:	$9,140	$1,985	$7,155
Costs:			
1) COSTS OF AGENCY SE PROGRAM (Individual Program)	$3,473	$0	$3,473
2) TARGETED JOB TAX CREDIT	$108	$0	$108
3) INCREASED TAXES PAID BY CONSUMER	$0	$353	($353)
Total Costs:	$3,581	$353	$3,228
Net Benefits:	$5,559	$1,632	$3,927
Benefit/Cost Ratio:	$2.55	$5.62	$2.22

Source: Table VII was adapted from Table 9 in the technical appendix of Lewis et al (1991).
Notes: All data are reported in per consumer per year terms with 1989 data drawn from actual consumer work experience. Net benefits would be larger if the one successfully closed case in competetive employment (without support) was included in increased productivity.

program are captured and reported accurately and fully in the analysis. This type of benefit-cost framework provides insights not only into the monetary benefits and costs, but also into those effects that cannot be valued monetarily. Nonmonetary values include such qualitative benefits as increased independent living, improved quality of life, reduction of functional limitations, and increased self esteem. The framework provides a structured means of identifying, measuring and evaluating the full range of costs and benefits of SE services. Most importantly, the social and private perspectives are clearly visible in all phases of the analysis.

Results and Findings

- **Consumer Demographic Characteristics and Work Activity.** Table 2 reports the summary of demographics and work activity for the sample of participants in each of the 11 agencies and 13 program sites in the study, according to the four training and employment program options. Several generalizations can be drawn from the information found in this study relative to the characteristics of individuals served. First, comparisons made across agencies for each of the four program areas illustrate considerable variability in the types of individuals being served. As a consequence, considerable caution must be observed in making judgments about relative performance as between agencies. Second, comparisons made across programs indicate that level of adaptive functioning (i.e., average ICAP score) generally follows type of program. Persons with disabilities served in individual SE had the highest levels of adaptive functioning and the lowest ratings of behavior problems when compared to persons served in any of the other three alternative program models. On the other hand, within-agency comparisons of both adaptive and problem behaviors across program areas reveal few differences among individuals served in group SE, on-site employment, or habilitation training. Based on trends in the data, type, level, and intensity of behaviors did not appear to strongly differentiate individuals across these three program areas.

  Generally, the less severe the disability, as measured by both proportion of persons served with moderate to profound mental retardation and ICAP scores, the more likely the individuals were to be placed in individual SE. Similarly, the severer the disability, and the more intensive the services, the more likely the individuals were to be placed in habilitation training. In these cases, the linkages were also reflected in generally higher average costs per client, and in the case of individual SE, these linkages were reflected in generally lower costs. However, in the case of employment options between on-site employment (sheltered) and community group SE, no clear pattern or linkage of disability levels and costs could be observed either between the options or between programs within the options.

  Although that it is generally assumed that costs follow resource needs for support services, and that these services follow client needs, as reflected in the average client's level and type of disability, this bit of "conventional wisdom" may be overstated relative to SE. When combining client demographic, functional characteristics, and adaptive characteristics information, as reported in the ICAP, with the type of cost information reported in Table 2, average annual costs do not appear to associate strongly with the client's level of disability, in either on-site sheltered, or group SE options. Findings such as this, derived through evaluations of SE's efficiency effects, have important policy implications. Knowing, for example, that the placement of individuals with disabilities in on-site sheltered vs. community group SE does not necessarily relate to the client's level of disability or adaptive behaviors places into question restrictions programs may set on the program participation of clients.

- **Agency and Program Costs.** Table 2 also reports selected agency characteristics and costs from the study. As noted in Table 2, extraordinary cost differences may develop in comparing alternative training and SE delivery systems. It is found that these cost differences result from a variety of factors, including a) the number of individuals being served, b) the community settings (i.e., employment opportunities nearby), c) the duration and intensity of services provided during days and hours of training or work, d) the particular characteristics of the persons served, e) the staff-to-client ratios and staff salaries, and f) the type and extent of support services.

  Two general conclusions can be drawn about these factors. First, it is generally understood that type of training or employment program strongly influences the type and amount of resources needed to deliver services. For example, it appears from the results of the study that almost all forms of habilitation training, on average, require almost twice as much in annual resource costs as do other employment options. There do not appear to be any consistent patterns of cost differences between type of SE when costs were expressed in annual terms. On the other hand, when costs were expressed in daily and hourly terms, it appeared that individual SE had the lowest costs among the three employment options. Second, the proportion of clients who are enrolled and then actually placed in jobs and provided support services is a key factor in costs. As expected, the variability between daily and hourly costs of the different employment options was largely a function of the number of days and hours in which the individuals were actually working.

- **Benefit-Cost Estimates.** The benefit-cost accounting framework of this study confirms that reasonably accurate empirical estimates can be made with respect to assessing the cost-effectiveness of alternative SE programs. A

■ Table 2: Summary of Agency Characteristics and Costs

Training and Employment Options	Illustrative SE Agencies in Minnesota (a)															
	DAC					REHAB						MH	RTC			
	A	B	C	D	E	F	G-1	G-2	G-3	H	J	K	L	$\bar{X}$	*SD*	MEDIAN
Total Number of Consumers	**74**	**35**	**72**	**60**	**75**	**258**	**222**	**95**	**134**	**152**	**93**	**94**	**528**			
Habilitation Training																
Number of consumers	NA	35	63	58	NA	NA	NA	95	NA	NA	NA	NA	528	155.8	209.16	63
Average ICAP score	NA	64.9	47.2	55.8	NA	NA	NA	68.1	NA	NA	NA	NA	46	56.40	10.86	55.8
Average ICAP maladaptive behavior score	NA	-18.7	-8.1	-11.7	NA	NA	NA	-7.7	NA	NA	NA	NA	-17.9	-12.82	5.25	-11.7
Proportion with moderate to profound MR	NA	30%	78%	66%	NA	NA	NA	77%	NA	NA	NA	NA	76%	66%	20%	76%
Average hours per day	NA	2.89	3.42	5.12	NA	NA	NA	2.83	NA	NA	NA	NA	3.94	3.64	0.94	3.42
Average annual costs per consumer	NA	$6,380	$8,017	$7,697	NA	NA	NA	$4,222	NA	NA	NA	NA	$10,698	$7,403	$2,370	$7,697
Average daily costs per consumer	NA	$42.98	$45.17	$34.12	NA	NA	NA	$21.21	NA	NA	NA	NA	$54.98	$39.69	$12.72	$42.98
Average hourly costs per consumer in attendance	NA	$14.87	$13.21	$6.66	NA	NA	NA	$7.49	NA	NA	NA	NA	$13.95	$11.24	$3.85	$13.21
On-Site Programs																
Number of consumers	11	26	34	49	NA	240	216	95	95	120	77	NA	316	116	99.06	95
Average ICAP score	76	63.7	43.8	59.1	NA	73.5	83.3	69	77.6	75.5	80.9	NA	49.1	68.32	12.98	73.5
Average ICAP maladaptive behavior score	-8.2	-19.2	-8.7	-11.7	NA	-9	-3.5	-7.3	-7.1	-7.6	-4.3	NA	-18.5	-9.55	5.10	-8.2
Proportion with moderate to profound MR	20%	25%	79%	66%	NA	14%	21%	76%	23%	34%	54%	NA	74%	43%	26%	34%
Average hours per day	6.59	0.30	0.86	2.23	NA	5.17	5.61	2.63	5.37	6.52	4.97	NA	2.01	3.84	2.28	4.97
Average annual costs per consumer	$6,345	$1,830	$911	$1,930	NA	$5,990	$5,636	$4,300	$1,649	$8,593	$8,616	NA	$2,886	$4,517	$2,952	$4,300
Average daily costs per consumer	$40.49	$28.49	$25.75	$8.61	NA	$35.99	$33.03	$21.83	$56.73	$51.57	$44.93	NA	$16.47	$33.08	$14.77	$33.03
Average hourly costs per consumer hour employed	$6.14	$94.97	$29.94	$3.86	NA	$6.96	$5.89	$8.30	$10.56	$7.91	$9.04	NA	$8.19	$17.43	$26.65	$8.19
Group Supported Employment																
Number of consumers	52	22	51	34	32	40	49	18	6	35	82	NA	41	38.50	19.48	40
Average ICAP score	78.2	62.4	55.1	65.1	67.3	80.6	82.8	65.4	77.7	75.8	80.7	NA	64.5	71.30	9.01	75.8
Average ICAP maladaptive behavior score	-6	-20.8	-7.7	-8.1	-18.3	-9.3	-3.4	-8.6	-6.8	-8	-4.1	NA	-16.2	-9.78	5.59	-8.05
Proportion with moderate to profound MR	34%	29%	73%	62%	16%	12%	21%	88%	13%	32%	54%	NA	58%	41%	25%	34%
Average hours per day	6.12	0.52	2.42	2.48	6.05	3.90	5.47	4.94	4.30	5.53	3.63	NA	2.80	4.01	1.72	4.30
Average annual costs per consumer	$6,371	$4,358	$3,344	$2,870	$5,606	$4,670	$1,993	$1,794	$1,385	$4,184	$2,260	NA	$5,436	$3,689	$1,656	$3,764
Average daily costs per consumer	$30.99	$90.80	$35.38	$20.63	$43.56	$36.40	$74.56	$43.58	$28.47	$39.25	$21.08	NA	$38.62	$41.94	$20.76	$37.51
Average hourly costs per consumer hour employed	$5.06	$174.62	$14.62	$8.32	$7.20	$9.33	$13.63	$8.82	$6.62	$7.10	$5.81	NA	$13.79	$22.91	$47.89	$8.57
Individual Supported Employment																
Number of consumers	17	19	11	2	45	27	81	30	70	48	8	94	2	34.92	30.61	27
Average ICAP score	80.7	72.8	74.3	77.5	76.3	84.6	85.8	66.4	79.9	80	83.6	92.4	74	79.10	6.69	79.9
Average ICAP maladaptive behavior score	-6.7	-14.5	-1.8	-13	-11.6	-7.4	-3	-6.4	-7.8	-6.6	-4.3	-4.4	-6	-7.19	3.79	-6.6
Proportion with moderate to profound MR	24%	16%	64%	0%	9%	10%	18%	67%	14%	30%	50%	0%	100%	31%	30%	18%
Average hours per day	4.79	1.89	4.32	1.00	4.83	4.59	4.88	4.20	5.93	5.67	7.38	7.75	5.00	4.79	1.85	4.83
Average annual costs per consumer	$3,473	$3,580	$4,009	$4,193	$1,549	$5,437	$2,024	$2,035	$2,029	$4,571	$451	$958	$5,168	$3,037	$1,625	$3,473
Average daily costs per consumer	$17.92	$32.07	$26.42	$18.39	$11.66	$43.34	$16.95	$12.86	$13.53	$33.39	$2.00	$15.54	$21.53	$20.43	$10.93	$17.92
Average hourly costs per consumer hour employed	$3.74	$16.97	$6.12	$18.39	$2.41	$9.44	$3.47	$3.06	$2.28	$5.89	$0.27	$2.01	$4.31	$6.03	$5.66	$3.74

Note: (a) Each agency is identified in the original study by Lewis et al. (1991).

NA = Program option not available in agency. $\bar{X}$ = Average of all programs. SD = Standard Deviation.

summary of the benefit-cost ratios is estimated for each of the agencies and their alternative programs in the study, and presented in Table 3. These ratios are presented in terms of both average and hourly data, and, as noted earlier, provide measures of the monetary efficiency of alternative employment options. The results indicate that all forms of SE are cost-effective when compared with habilitation training, with annual returns for society averaging over $2 for each $1 invested in SE. When SE programs (i.e., both group and individual) are compared with on-site employment, as noted in Table 3, positive results for society are indicated in seven of the 11 agencies and in 15 of the 22 SE programs, with annual returns for most of the agencies as a group averaging between $1.30 and $4.00 for each $1 invested. Among the four options examined in the study, the clearest case for monetary efficiency from the societal perspective is found when individual SE options are compared with all other training and employment options. In a clear majority of comparative cases (i.e., 23 of 28 cases), individual SE programs were found to have positive benefit-cost ratios greater than one. These results come about largely through the higher wage rates, longer hours of work, and generally lower service costs found within individual SE programs.

Beyond the potential financial savings to society

BEST COPY AVAILABLE

■ Table 3: Summary of Social Costs and Benefits Across SE Agencies

SOCIAL COSTS AND BENEFITS	ILLUSTRATIVE SUPPORTED EMPLOYMENT AGENCIES IN MINNESOTA													AVG	MEDIAN	MIN - MAX
	DAC A	DAC B	DAC C	DAC D	DAC E	REHAB F	REHAB G-1	REHAB G-2	REHAB G-3	REHAB H	REHAB J	MH K	RTC L			
Average Costs of Supported Employment																
(Annual) For Individual SE vs. Group SE	$3,581	$3,580	$4,596	$4,193	$1,709	$5,775	$2,563	$2,906	$2,801	$4,588	$451	NA	$7,064	$3,651	$3,581	$451 - $7,064
(Hourly) For Individual SE vs. Group SE	$3.86	$16.97	$6.96	$18.39	$2.67	$10.00	$3.74	$3.96	$1.82	$5.91	$0.27	NA	$5.89	$6.70	$4.94	$0.27 - $18.39
(Annual) For Individual SE vs. On-Site Employment	$3,581	$3,580	$4,613	$4,193	NA	$5,901	$2,691	$3,026	$3,162	$4,588	$451	NA	$7,064	$3,895	$3,581	$451 - $7,064
(Hourly) For Individual SE vs. On-Site Employment	$3.86	$16.97	$7.04	$18.39	NA	$10.25	$4.61	$4.55	$3.55	$5.91	$0.27	NA	$5.89	$7.39	$5.89	$0.27 - $18.39
(Annual) For Individual SE vs. Habilitation Training	NA	$3,580	$4,613	$4,193	NA	NA	NA	$3,026	NA	NA	NA	NA	$7,064	$4,495	$4,193	$3,026 - $7,064
(Hourly) For Individual SE vs. Habilitation Training	NA	$16.97	$7.04	$18.39	NA	NA	NA	$4.55	NA	NA	NA	NA	$5.89	$10.57	$7.04	$4.55 - $18.39
(Annual) For Group SE vs. On-Site Employment	$6,371	$4,358	$3,362	$2,870	NA	$4,796	$2,121	$1,914	$1,747	$4,184	$2,260	NA	$5,436	$3,584	$3,362	$1,747 - $6,371
(Hourly) For Group SE vs. On-Site Employment	$5.06	$174.62	$14.70	$8.32	NA	$9.58	$14.50	$9.41	$8.35	$7.10	$5.81	NA	$13.79	$24.66	$9.41	$5.06 - $174.62
(Annual) For Group SE vs. Habilitation Training	NA	$4,358	$3,362	$2,870	NA	NA	NA	$1,914	NA	NA	NA	NA	$5,436	$3,588	$3,362	$1,914 - $5,436
(Hourly)For Group SE vs. Habilitation Training	NA	$174.62	$14.70	$8.32	NA	NA	NA	$9.41	NA	NA	NA	NA	$13.79	$44.17	$13.79	$8.32 - $174.62
(Annual) For On-Site Employment vs. Habilitation Training	NA	$1,830	$911	$1,930	NA	NA	NA	$4,300	NA	NA	NA	NA	$2,886	$2,371	$1,930	$911 - $4,300
(Hourly) For On-Site Employment vs. Habilitation Training	NA	$94.97	$29.94	$3.86	NA	NA	NA	$8.30	NA	NA	NA	NA	$8.19	$29.05	$8.30	$3.86 - $94.97
Average Benefits of Supported Employment																
(Annual) For Individual SE vs. Group SE	$7,916	$5,828	$5,301	$3,050	$5,940	$5,675	$4,326	$3,976	$5,254	$6,153	$7,026	NA	$9,771	$5,851	$5,752	$3,050 - $9,771
(Hourly) For Individual SE vs. Group SE	$7.28	$175.03	$16.53	$11.15	$8.25	$11.03	$15.67	$9.85	$8.61	$8.57	$7.18	NA	$15.93	$24.59	$10.44	$7.18 - $175.03
(Annual) For Individual SE vs. On-Site Employment	$9,140	$3,330	$3,289	$2,869	NA	$7,011	$6,526	$6,085	$6,076	$11,141	$12,693	NA	$7,668	$6,893	$6,526	$2,869 - $12,693
(Hourly) For Individual SE vs. On-Site Employment	$9.03	$95.41	$32.23	$8.12	NA	$9.48	$8.60	$10.19	$13.90	$10.33	$10.88	NA	$11.03	$19.93	$10.33	$8.12 - $95.41
(Annual) For Individual SE vs. Habilitation Training	NA	$7,965	$10,480	$8,697	NA	NA	NA	$6,886	NA	NA	NA	NA	$15,959	$9,997	$8,697	$6,886 - $15,959
(Hourly) For Individual SE vs. Habilitation Training	NA	$19.59	$16.65	$11.04	NA	NA	NA	$11.05	NA	NA	NA	NA	$18.33	$15.33	$16.65	$11.04 - $19.59
(Annual) For Group SE vs. On-Site Employment	$7,569	$1,861	$1,332	$2,689	NA	$6,007	$4,193	$3,904	$2,206	$9,172	$7,927	NA	$3,333	$4,563	$3,904	$1,332 - $9,172
(Hourly) For Group SE vs. On-Site Employment	$6.81	$95.00	$30.23	$5.29	NA	$7.78	$6.56	$9.15	$11.91	$8.86	$9.52	NA	$8.89	$18.18	$8.89	$5.29 - $95.00
(Annual) For Group SE vs. Habilitation Training	NA	$6,495	$8,522	$8,517	NA	NA	NA	$4,704	NA	NA	NA	NA	$11,625	$7,973	$8,517	$4,704 - $11,625
(Hourly) For Group SE vs. Habilitation Training	NA	$19.18	$14.74	$8.21	NA	NA	NA	$10.02	NA	NA	NA	NA	$16.19	$13.67	$14.74	$8.21 - $19.18
(Annual) For On-Site Employment vs. Habilitation Training	NA	$6,465	$8,102	$7,757	NA	NA	NA	$5,101	NA	NA	NA	NA	$11,178	$7,721	$7,757	$5,101 - $11,178
(Hourly) For On-Site Employment vs. Habilitation Training	NA	$19.14	$14.36	$6.78	NA	NA	NA	$9.17	NA	NA	NA	NA	$15.49	$12.99	$14.36	$6.78 - $19.14
Social Benefit/Cost Estimates Ratio																
(Annual) For Individual SE vs. Group SE	$2.21	$1.63	$1.15	$0.73	$3.48	$0.98	$1.69	$1.37	$1.88	$1.34	$15.58	NA	$1.38	$2.79	$1.51	$0.73 - $15.58
(Hourly) For Individual SE vs. Group SE	$1.89	$10.31	$2.38	$0.61	$3.09	$1.10	$4.19	$2.49	$4.73	$1.45	$26.59	NA	$2.70	$5.13	$2.60	$0.61 - $26.59
(Annual) For Individual SE vs. On-Site Employment	$2.55	$0.93	$0.71	$0.68	NA	$1.19	$2.43	$2.01	$1.92	$2.43	$28.14	NA	$1.09	$4.01	$1.92	$0.68 - $28.14
(Hourly) For Individual SE vs. On-Site Employment	$2.34	$5.62	$4.58	$0.44	NA	$0.92	$1.87	$2.24	$3.92	$1.75	$40.30	NA	$1.87	$5.99	$2.24	$0.44 - $40.30
(Annual) For Individual SE vs. Habilitation Training	NA	$2.22	$2.27	$2.07	NA	NA	NA	$2.28	NA	NA	NA	NA	$2.26	$2.22	$2.26	$2.07 - $2.28
(Hourly) For Individual SE vs. Habilitation Training	NA	$1.15	$2.37	$0.60	NA	NA	NA	$2.43	NA	NA	NA	NA	$3.11	$1.93	$2.37	$0.60 - $3.11
(Annual) For Group SE vs. On-Site Employment	$1.19	$0.43	$0.40	$0.94	NA	$1.25	$1.98	$2.04	$1.26	$2.19	$3.51	NA	$0.61	$1.44	$1.25	$0.40 - $3.51
(Hourly) For Group SE vs. On-Site Employment	$1.35	$0.54	$2.06	$0.64	NA	$0.81	$0.45	$0.97	$1.43	$1.25	$1.64	NA	$0.64	$1.07	$0.97	$0.45 - $2.06
(Annual) For Group SE vs. Habilitation Training	NA	$1.49	$2.53	$2.97	NA	NA	NA	$2.46	NA	NA	NA	NA	$2.14	$2.32	$2.46	$1.49 - $2.97
(Hourly) For Group SE vs. Habilitation Training	NA	$0.11	$1.00	$0.99	NA	NA	NA	$1.06	NA	NA	NA	NA	$1.17	$0.87	$1.00	$0.11 - $1.17
(Annual) For On-Site Employment vs. Habilitation Training	NA	$3.53	$8.89	$4.02	NA	NA	NA	$1.19	NA	NA	NA	NA	$3.87	$4.30	$3.87	$1.19 - $8.89
(Hourly) For On-Site Employment vs. Habilitation Training	NA	$0.20	$0.48	$1.76	NA	NA	NA	$1.10	NA	NA	NA	NA	$1.89	$1.09	$1.10	$0.20 - $1.89

Source: Benefit/Cost Tables for each of the respective agencies reported in the technical appendix of Lewis et al. (1991).

resulting from most of these programs, it can be anticipated that the amount of increased disposable income available to individuals with disabilities participating in these programs is likely to increase their opportunities for greater community participation and social integration. It is clear that all of the nonmonetary benefits (such as increased community integration, quality of life, and self esteem) accruing to both individuals and society as a consequence of SE are an addition to whatever monetary effects may result.

■ Future Considerations in SE Evaluation

Reaching Consensus on Goals and Outcomes

There remains a lack of professional consensus on the goals and outcomes of SE for individuals with disabilities. The question of whether to evaluate SE solely on the basis of economic criteria (i.e., cost-efficiency, cost-benefit, or economic impact on individuals' earnings) or to focus on the social benefits to participants (i.e., social integration, quality of life, increases in skill levels) continues with considerable debate among researchers and professionals. Increasingly, researchers (e.g., Parent, Kregel, Twardzik, & Metzler, 1990; Rusch, Chadsey-Rusch, & Johnson, 1991) have even argued that valuing SE strictly on the basis of its cost-effectiveness is illegitimate, and that SE should be valued primarily from its capacity to assist individuals in achieving social and community integration. Agreement on critical dimensions and outcome-indicators to measure social and community integration, quality of life, and other qualitative outcomes of SE, however, has not been achieved. Consensus on common quantitative and qualitative outcome measures is of critical importance when attempting to evaluate the effectiveness and efficiency of programs across differing settings and contexts.

Improved Conceptual Frameworks

Improved conceptual and analytic frameworks and methods are critically needed to understand the full impact of SE programs. Recently, there have been a number of investigations that have sought to improve upon the measurement of community adjustment through the development and validation of multi-dimensional outcome measures. This research has, in part, investigated community adjustment as a function of several dimensions including demographics; employment activities; education, employment, job training, or day habilitation arrangements; family and friend social network; community involvement; personal satisfaction level; and financial independence (see Bruininks, McGrew, Thurlow, & Lewis, 1990; Halpern, Nave, Close, & Nelson, 1986; McGrew, Johnson, & Bruininks, 1992). A variety of factor analytic and other multivariate procedures to derive composite variables were employed in these studies.

The construction of composite variables based on the reduction of many single outcome variables aids researchers and evaluators in two ways. First, the sheer number of variables included in outcome studies of employment and community services can be reduced. This not only saves valuable time during data collection and analysis, but reduces the tendency to misinterpret results when interrelationships among many variables must be explained. Second, validation of multi-dimensional outcome measures may contribute to the development and empirical evaluation of comprehensive models of employment integration and related dimensions of community adjustment for individuals with severe disabilities. Considerable experimentation and research must ensue in coming years to fully capture the complex, multi-faceted nature of SE programs.

Controlling for Individual Characteristics

In order to provide for meaningful cross-program and cross-agency comparisons of the impacts and benefits of SE services on individuals with disabilities, standard measures for describing individuals are needed. In the case-study described earlier (Lewis, Johnson, Bruininks, Kallsen, & Guillery, 1991), the Inventory for Client and Agency Planning [ICAP] (Bruininks, Hill, Weatherman, & Woodcock, 1986), was used as the statistical control of individual characteristics for examining the relative costs and impacts of supported employment. The ICAP yields standard scores, which are useful for aggregating and analyzing information across individuals and programs. Most other evaluation studies of SE report only IQ scores or generalize to broad disability classification schemes. These indices provide only a limited understanding of the relationship of individual attributes and characteristics to SE outcomes and costs. Standardized instruments such as the ICAP aid the evaluator in making comparisons of program outcomes and costs on a wider range of individual characteristics (i.e., diagnostic status, functional limitations, adaptive behavior, problem behavior, as well as the service-related status, and other needs of individuals with disabilities). This is important in broadening our understanding of the impact of SE on individuals and facilitating improvements in cross-agency and cross-program comparisons.

- **Establishing Common Accounting Frameworks.** SE agencies need to attend to developing a common accounting framework for the reporting of their costs. Without such a common framework, only limited progress is likely in achieving more effective or efficient deployment of resources in SE and for making cost and outcome comparisons over time or between programs. The ultimate benefit of conducting cost and outcome analyses

of such service programs is to create greater understanding of the use of public resources, and the development of strategies to achieve the most appropriate and effective service programs in the most efficient manner. The principal value of the resource components paradigm for estimating costs illustrated in the case-study presented earlier (Lewis, Johnson, Bruininks, Kallsen, & Guillery, 1991) lies in its comprehensiveness and accuracy. With an appropriately framed cost model, it is feasible for administrators and policymakers to evaluate resource usage in current programs and to stimulate the resource consequences of different policy and administrative alternatives. Similarly, with an appropriately framed benefit-cost accounting framework, it is possible to examine questions of cost-effectiveness, both from the perspective of society and of the individuals served.

- **Understanding the Cost-Effectiveness of the Supported Employment Programs**. Little attention has been directed to evaluating the cost-effectiveness of SE programs. For both public policy development and individual level program planning, information about the relative cost-effectiveness of alternative programs for persons with disabilities is critically needed. Attempting to find relationships between program costs and effectiveness measures in SE has been difficult. Nevertheless, program alternatives sharing similar goals can be compared according to their relative costs and outcomes. Those alternatives with the lowest relative cost-effectiveness ratios could be considered the most promising with respect to use of society's resources, uses the fewest resources to achieve the program's goals.

  When the evaluation context is one in which multiple criteria and attributes must be considered, as in SE, the challenge to the evaluator or choice maker is how to convert these multiple outcomes into a single index that can be compared across several alternatives or options (Lewis, Erickson, Johnson, Bruininks, 1991). Determining appropriate and meaningful indices against which the relative cost-effectiveness of SE can be evaluated and compared with other service delivery alternatives (e.g., sheltered employment, work activity, day activity programs) is a highly challenging task. Further, issues related to the cost-effectiveness of using alternative models of SE (e.g., individual placement, enclave, mobile, work-crew, or entrepreneurial models), and whether or not individual or group placement models are more cost-effective remain unresolved. Such information is, however, important from the standpoint of both public policy and program management, as efforts to expand employment services continue nationally.

  Here the critical importance of achieving consensus on the multi-dimensional nature of SE outcomes is evident. If community integration, for example, is valued and viewed as the single most important outcome and attribute of SE for individuals with severe disabilities, more sophisticated methods for measuring and communicating this important dimension will be needed. Thus far, this valued dimension has not adequately been accounted for in evaluations of program costs and outcomes. Researchers must continue to search for ways to formulate valid and reliable composite outcome indicators for use in conducting meaningful cost-effectiveness evaluations of SE programs.

■ Conclusion

Center-stage in SE's short history has been the need for ongoing evaluations of its social and economic benefits and outcomes. Reliable and complete outcome and cost information is fast becoming an essential aspect of federal, state, and local decision-making, and a necessity for planning and improving SE programs and services. The evaluation models and strategies described in this publication address the difficulties and complexities involved in evaluating the efficiency and effectiveness of SE programs. Researchers and policymakers are encouraged to experiment with their applicability and relevance in future evaluations of SE services.

■ References

- Atkisson, C. C., Hargreaves, W. A., Horowitz, M. J., & Sorenson, L. E. (Eds.). (1978). Evaluation of human services programs. New York: Academic Press.
- Berkowitz, E. D. (1980). Rehabilitation: The federal government's response to disability, 1935-1954. New York: Arno Press.
- Berkowitz M., & Berkowitz, E. D. (1983). Rehabilitation research review: Benefit-cost analysis. Washington DC: U.S. Department of Education, the National Rehabilitation Information Center.
- Bolton, B., (1987). Scores and norms. In Brian Bolton (Ed.), Handbook of measurement and evaluation in rehabilitation (2nd ed) (pp. 3-20). Baltimore: Paul H. Brookes Publishing Co.
- Borg, W. R., & Gall, M. D. (1983). Educational research: An introduction. New York: Longman.
- Bruininks, R. H., Hill, B. K., Weatherman, R. F., & Woodcock, R. W. (1986). Inventory for client and agency planning. Allen TX: DLM Teaching Resources.
- Bruininks, R. H., McGrew, K., Thurlow, M., & Lewis, D. R. (1990). Dimensions of community adjustment among young adults with intellectual disabilities. In W. Fraser (Ed.), Key issues in mental retardation research, (pp. 435-448). London: Routledge.
- Conley, R. W., & Noble, J. H. (1990). Benefit-cost analysis of supported employment. In F. R. Rusch (Ed.), Supported employ-

ment: Models, methods, and issues (p. 271-287). Sycamore IL: Sycamore Publishing Co.

- DeStefano, L. (1990). Designing and implementing program evaluation. In F. R. Rusch (Ed.), Supported employment: Models, methods, and issues. DeKalb IL: Sycamore Publishing Co.
- DeStefano, L., & Wagner, M. (1990). Outcome assessment in special education: Lessons learned. Rockville MD: WESTAT.
- Halpern, A. S., Nave, G., Close, C., & Nelson, D. (1986). An empirical analysis of the dimensions of community adjustment for adults with mental retardation in semi-independent living programs. Australia and New Zealand Journal of Developmental Disabilities, 12(3), 147-157.
- Hill, M., & Wehman, P. (1983). Cost benefit analysis of placing moderately and severely handicapped individuals into competitive employment. Journal of the Association for the Severely Handicapped, 8, 30-39.
- Hill, M., Wehman, P., Kregel, J., Banks, P. D., & Metzler, H. M. (1987). Employment outcomes for people with moderate and severe disabilities: An eight-year longitudinal analysis of supported competitive employment. Journal of the Association for the Severely Handicapped, 12, 182-189.
- Johnson, D. R., & Lewis, D. (in press). Supported employment: Program models, strategies and evaluation perspectives. In M. Hayden & B. Abery (Eds.), Challenges for a service system in transition: Ensuring quality experiences for people with developmental disabilities. Baltimore: Paul H. Brookes Publishing Co.
- Johnston, M. V. (1987). Cost-benefit methodologies in rehabilitation. In R. Fuhrer (Ed), Rehabilitation outcomes: Analysis and measurement (pp. 99-113). Baltimore: Paul H. Brookes Publish.
- Kerachsky, S., & Thornton, C. (1987). Findings from the STETS transitional employment demonstration. Exceptional Children, 53(6), 515-521.
- Kerachsky, S., Thornton, C., Bloomenthal, A., Maynard, R., & Stephens, S. (1985). Impacts of transitional employment on mentally retarded young adults: Results of the STETS demonstration. Princeton NJ: Mathematica Policy Research.
- Kleinbaum, D. G., Kupper, L. L., & Miller, K. E. (1988). Applied regression analysis and other multi-variable methods. Boston: PWS-KENT Publishing Co.
- Lam, C. S. (1986). Comparison of sheltered and supported work programs: A pilot study. Rehabilitation Counseling Bulletin, 30(2), 66-82.
- Lewis, D., Bruininks, R., & Thurlow, M. (1989). Cost analysis for district level special education planning, budgeting and administrating. Journal of Education Finance, 14(4), 466-483.
- Lewis, D. Bruininks, R., & Thurlow, M. (1990). Benchmark cost analysis of special schools for students with mental retardation. Journal of Special Education, 24(1), 33-50.
- Lewis, D. R., Erickson, R. N., Johnson, D. R., & Bruininks, R. H. (1991). Using multiattribute utility evaluation techniques in special education. St. Paul: Minnesota Department of Education, Unique Learner Needs Section.
- Lewis, D. R., Johnson, D. R., Bruininks, R. H. & Kallsen, L. A. (1993). Accounting for costs in habilitation training, sheltered workshops, and supported employment. Education and Training in Mental Retardation, 28(1), 75-89.
- Lewis, D. R., Johnson, D. R., Bruininks, R. H. Kallsen, L. A., & Guillery, R. P. (1991). Costs and benefits of supported employment in Minnesota. Minneapolis: Institute on Community Integration (UAP), College of Education, University of Minnesota.
- Lewis, D. R., Johnson, D. R., Bruininks, R. H., Kallsen, L., & Guillery, P. (1992). Is supported employment cost-effective in Minnesota? Journal of Disability Policy Studies, 3(1), 67-92.
- Lewis, D. R., Johnson, D. R., Chen, T. H., & Erickson, R. N. (1992). On the use and reporting of benefit-cost analyses by state vocational rehabilitation agencies. Evaluation Review, 16(3), 266-287.
- Madaus, G., Scriven, M. & Stufflebeam, D. (1985). Evaluation models: Viewpoints on educational and human services evaluation. Boston: Kluwer-Nijhoff Publishing.
- McGrew, K., Johnson, D. R., & Bruininks, R. H. (1992). Factor analysis of community adjustment outcome measures for young adults with mild to severe disabilities. Manuscript submitted for publication.
- Noble, J. H., Jr. (1977). The limits of cost-benefit analysis as a guide to priority setting in rehabilitation. Evaluation Quarterly, 1(3), 347-379.
- Noble, J. H., Jr., & Conley, R. W. (1987). Accumulating evidence on the benefits and costs of supported and transitional employment for persons with severe disabilities. Journal of The Association of Persons with Severe Handicaps, 12(3), 163-174.
- Noble, J. H., Conley, R. W., Banerjee, S., & Goodman, S. (1991). Supported employment in New York State: A comparison of benefits and costs. Journal of Disability Policy Studies, 2(1), 39-7.
- Parent, W. S., Kregel, J., Twardzik, G., & Metzler, H. M. D. (1990). Social integration in the workplace: An analysis of the integration activities of workers with mental retardation and their coworkers. In J. Kregel, P. Wehman, & M. Shafer (Eds.), Supported employment for persons with severe disabilities: From research to practice, Volume III. Richmond: Virginia Commonwealth University Rehabilitation Research and Training Center.
- Posavac, E. J. & Carey, R. G. (1980) Program evaluation: Methods and case studies. Engelwood Cliffs NJ: Prentice Hall.
- Rhodes, L., Ramsing, K., & Hill, M. (1987). Economic evaluation of employment services: A review of applications. Journal of the Association for Persons with Severe Handicaps, 12, 175-181.
- Rossi, P. H., Freeman, H. E., & Wright, S. R. (1975). Evaluation: A systematic approach. Beverly Hills CA: Sage Publications.
- Rusch, F. R., Chadsey-Rusch, J., & Johnson, J. R. (1991). Supported employment: Emerging opportunities for employment integration. In L. Meyer, C. Peck, & L. Brown (Eds.), Critical issues in the lives of people with severe disabilities (pp. 145-169). Baltimore: Paul H. Brookes.

- Schalock, R. L. (1988). Critical performance evaluation indicators in supported employment. In P. Wehman & M. S. Moon (Eds.), Vocational rehabilitation and supported employment (pp. 163-174). Baltimore: Paul H. Brookes.
- Schalock, R. L., & Hill, (1986). Evaluating employment services. In W. K. Kiernan & J. A. Stark (Eds.), Pathways to employment for adults with developmental disabilities (pp. 285-302). Baltimore: Paul H. Brookes.
- Schalock, R. L., & Thornton, C. (1988). Program evaluation: A field guide for program administrators. New York: Plenum.
- Schneider, K., Martin, J., & Rusch, F. (1981). Cost versus benefits between sheltered and nonsheltered vocational training programs: Are we sacrificing quality? Counterpoint, (November) 1-28.
- Shafer, M. S., Wehman, P., Kregel, J., & West, M. (1990). National supported employment initiative: A preliminary analysis. American Journal of Mental Retardation, 95(3), 316-327.
- Thornton, C., & Maynard, R. (1989). The economics of transitional employment and supported employment. In M. Berkowitz & M. A. Hill (Eds.), Disability and the labor market. Ithaca: Cornell University, New York State School of Industrial and Labor Relations; ILR Press.
- Walls, R. T., & Tseng, M. S. (1987). Measurement of client outcomes in rehabilitation. In Bolton (Ed.), Handbook of measurement and evaluation in rehabilitation (2nd ed) (pp. 183-201. Baltimore: Paul H. Brookes Publishing Co.
- Wehman, P., Kregel, J., & Shafer, M. S. (1989). Emerging trends in the national supported employment initiative: A preliminary analysis of twenty-seven states. Richmond VA: Virginia Commonwealth University, Rehabilitation Research and Training Center.

Policy Research Brief
May 1993 • Vol. 5, No. 2

Policy Research Brief is published by the Research and Training Center on Residential Services and Community Living, Institute on Community Integration (UAP), College of Education, University of Minnesota. This publication is supported, in part, by Cooperative Agreement #H133B80048 from the National Institute on Disability and Rehabilitation Research (NIDRR). The data reported were collected with support from the Minnesota Department of Rehabilitative Services DRS Grant # 07DD0282101.

This issue is authored by David R. Johnson, Darrell R. Lewis, and Robert H. Bruininks. Issue editor is Mary Hayden. Managing editor is Vicki Gaylord. The opinions expressed are those of the authors and do not necessarily reflect the position of NIDRR or DRS.

Additional copies of Policy Research Brief are available for $1 each. To order, send check or purchase order payable to University of Minnesota to the **Institute on Community Integration, University of Minnesota, 109 Pattee Hall, 150 Pillsbury Drive SE, Minneapolis, MN 55455 • (612) 624-4512.** Policy Research Brief is available in alternative formats upon request; to request an alternative format contact the publications office at the above address/phone.

The University of Minnesota is an equal opportunity employer and educator.

Center on Residential Services and Community Living
Institute on Community Integration
University of Minnesota
109 Pattee Hall, 150 Pillsbury Drive SE
Minneapolis, MN 55455

Non Profit Org
U.S. Postage
PAID
Minneapolis, MN
Permit No. 155

Address Correction Requested

**********ALL FOR STATE
ERIC 33
CLEAR'GHS HANDICAPPED/GIFT
1920 ASSOCIATION DR
RESTON VA 22091